


### REMARKS

Claims 1 through 14 are in this application and are presented for consideration. Claims 1 through 7 have been amended and new claims 8 through 14 have been added. The amended claims present the same subject matter as the original claims but have been amended to adapt them to the U. S. style. The new claims present subject matter similar to the original claims, but in a different form.

The specification and claims have been amended in order to place this application in better form. The reference to claims in the specification has been deleted or amended. Appropriate headings have been added. No new matter has been added.

Favorable action on the merits is respectfully requested.

Respectfully submitted  
for Applicant,

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JJM:jj/  
71659.1

Enclosed: Substitute Specification and Marked up copy of Translation

DATED: March 10, 2005  
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BY: Jonathan Forte DATE: March 10, 2005

**Roof Module for a Motor Vehicle Body**

**Description:**

Docket #71659

**ROOF MODULE FOR A MOTOR VEHICLE BODY**

**CROSS REFERENCE TO RELATED APPLICATIONS**

**[0001]**      This application is a United States National Phase application of International Application PCT/EP2003/001818 and claims the benefit of priority under 35 U.S.C. § 119 of German Application DE 102 51 175.6 filed October 31, 2002, the entire contents of which are incorporated herein by reference.

**FIELD OF THE INVENTION**

**[0002]**      The invention relates to a roof module for a motor vehicle body comprising a reinforcing frame and a roof panel that is fastened thereto, wherein said reinforcing frame can be

fastened to the motor vehicle body by means of screw connections and adhesive bonds.

## BACKGROUND OF THE INVENTION

**[0003]** Roof modules for motor vehicle bodies are known in different versions. A prior art version (DE 198 53 820 A1) is introduced as a prefabricated component, which various accessories are mounted to, through the front window opening into the car body and placed from inside against the roof opening and fastened there. The completion of the car body interior is performed subsequently, with it being required to temporarily hang-out motor vehicle body side doors possibly installed already before.

**[0004]** In another version (DE 100 48 130 A1) the roof module features foldable edge strips that are transfolded to be able to introduce the roof module through a roof opening into the motor vehicle body. Subsequently the edge strips are unfolded again and the roof module is placed from inside against the motor vehicle body and fastened there. All this is too costly.

## SUMMARY OF THE INVENTION

**[0005]** Now, therefore, it is the task of the present invention to provide a prefabricated and lacquered roof module equipped with all accessories that can be put onto the motor vehicle body during final assembly.

**[0006]** This task is solved by a roof module of the species described hereinabove in that the reinforcing frame or roof panel at its edge has a folded flange shaped to a U section, and that an edge strip of the roof panel or reinforcing frame engages into the U section and is bonded there to the reinforcing frame or roof panel, and that the roof module in a vertical projection is greater than a roof opening in the motor vehicle body. The roof panel and the reinforcing frame may be comprised of pretreated and prelacquered metal sheets (coil coating) so that the supplier needs no lacquer coating units. Furthermore, the roof module may be provided with all the desired accessories both inside and outside. The roof module is not put on in a raw construction state, i.e. before the motor vehicle body is lacquered, but only during final assembly onto an appropriately modified motor vehicle body. The relatively large roof opening, too, facilitates thus the assembly of the interior outfit of the motor vehicle body and of the instrumentation panel, and the usual temporary disassembly of side doors, if any, may be dispensed with.

**[0007]** It is recommendable to seal an external joint between the folded flange and the roof panel.

**[0008]** Additional covering and cladding elements are not required, if the proposed procedure is observed.

**[0009]** The U section may have a support for the front window outside in the area of a

front window.\_ In this connection, the roof panel may be provided with a step in the area of the front window, whose height roughly corresponds to the thickness of the front window.

**[0010]** Furthermore, the U section may have a support in the door area for the side windows and/or a window pane seal co-acting with the side windows.\_ In this connection, the roof panel in the door area may preferably have a step, whose height roughly corresponds to the thickness of the side window and/or window pane seal.

~~Some examples for the~~

**[0011]** The various features of novelty which characterize the invention are pointed out with particularity in the claims annexed to and forming a part of this disclosure. For a better understanding of the invention, its operating advantages and specific objects attained by its uses, reference is made to the accompanying drawings and descriptive matter in which preferred embodiments of the invention as shown on the relevant drawing are explained below, where:

~~Fig. are illustrated.~~

### BRIEF DESCRIPTION OF THE DRAWINGS

**[0012]** In the drawings:

**[0013]** Fig. 1 is a schematic view of a roof panel and of a reinforcing frame not yet connected to it;

**[0014]** Fig. 2 is a vertical ~~section~~sectional view in the area of a front window of a roof module connected to a motor vehicle body;

5 **[0015]** Fig. 3 is an enlarged detail view of the object according to Fig. 2;

**[0016]** Fig. 4 is a corresponding vertical ~~section~~sectional view in the door area;

**[0017]** Fig. 5 is a corresponding vertical ~~section~~sectional view in the area of a rear flap;

**[0018]** Fig. 6 is a corresponding vertical ~~section~~sectional view in the door area with another embodiment.

10 ~~A roof panel (1)~~

## DESCRIPTION OF THE PREFERRED EMBODIMENTS

**[0019]** Referring to the drawings in particular, a roof panel 1 and a reinforcing frame (2) belong to the depicted roof module (Fig. 1).

**[0020]** In Figures 2 to 6, ~~equal~~the same reference symbols designate ~~equal~~the same parts.

5 The reinforcing frame (2) or the roof panel (1) have a circumferential edge strip (10) and/or (13), as well as a folded flange (11) connected thereto. The folded flange (11) is transfolded over the edge strip (10) and/or (13) and together they form a U section (12). An edge strip (10) and/or (13) of the roof panel (1) and/or reinforcing frame (2) engage into the U-section (12) which is bonded with the edge strip (10) and/or (13) via a structural bonding. The external joint between  
10 folded flange (11) and edge strip (10) and/or (13) of roof panel (1) or reinforcing frame (2) is sealed with a sealing (6) to provide protection from corrosion. A shaped step (4) of roof panel (1) connects to edge strip (13), so that a support (14) connected to shaped step (4) is mainly flush to the transfolded folded flange (11).

**[0021]** The roof module is fastened in a usual manner with adhesive bonds (5) and screw  
15 connections (8) to the motor vehicle body (3).

**[0022]** Fig. 2 and Fig. 3 depict the roof module fastened to the motor vehicle body (3) in



the area of the front window. Roof panel (1) and reinforcing frame (2) are supported against each other via an adhesive bond (9) at some distance from the edge area. In connection to support (14), roof panel (1) has a step (15), whose height roughly corresponds to the thickness of a non-depicted front window, so that roof panel (1) is mainly flush outside to a front window fastened at the edge side on support (14).

**[0023]** Fig. 4 shows a vertical section through the roof module in the door area, which is connected to the motor vehicle body (3). Here, too, the edge strip (13) of roof panel (1) passes via a shaped step into a support (16), which is step (17) is connected to. Support (16) is provided for a non-depicted side door window and/or the pertaining window pane seal. Step (17) has a height that roughly corresponds to the thickness of the side door window pane and/or window pane seal.

**[0024]** Fig. 5 shows the configuration of roof panel (1) in the area of a non-depicted rear flap, with the step in the roof panel being dispensed with.

**[0025]** Fig. 6 shows a vertical section through the roof module in the door area connected to motor vehicle body (3). Here, the edge of roof panel (1) is folded over the edge strip of reinforcing frame (2).

**[0026]** By way of the measures described hereinabove, the connection of roof panel (1) to the reinforcing frame (2) is made invisible and/or sealed in all areas.

**[0027]** The roof module can be put onto and fastened to the motor vehicle body (3) in the course of final assembly, after the interior outfit has been introduced through the existing large roof opening into an appropriately modified motor vehicle body and installed there.

#### **List of References**

1——Roof panel

2——Reinforcing frame

3——Motor

**[0028]** While specific embodiments of the invention have been shown and described in detail to illustrate the application of the principles of the invention, it will be understood that the invention may be embodied otherwise without departing from such principles.

## ABSTRACT OF THE DISCLOSURE

A roof module for a motor vehicle body

4 — Shaped step at 1

5 — Adhesive bonds between 2 and 3

5 6 — Sealing between 11 and 1

7 — Structural bonding between 10 and 13

8 — Screw (3) includes a reinforcing frame (2) and a roof panel (1) that is fastened thereto.

The reinforcing frame (2) can be fastened to the motor vehicle body (3) by screw connections

9 — Adhesive bond between 1 and 2

10 10 — Edge strip of 2

11 — Folded flange

12 — (8) and adhesive bonds (5). A roof module, which is both prefabricated with all accessories as well as painted and which can be placed onto the motor vehicle body (3) during

final assembly is provided with the reinforcing frame (2) or the roof panel (1) having, on the edge thereof, a folded flange (11), which is shaped so that it has a U-shaped profile

+3 — Edge strip of +

+4 — Support

5 +5 — Step

+6 — Support

+7 — Step

10 (12). An edge strip (10, 13) of the roof panel (1) or of the reinforcing frame (2) engages inside the U-shaped profile (12) and is bonded therein to the reinforcing frame (2) or to the roof panel (1). The roof module is larger in a vertical projection than a roof opening in the motor vehicle body (3).